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A NEW SPECIES OF PHYLLOPOD CRUSTACEAN FROM THE SOUTHWESTERN SHORT-GRASS PRAIRIES

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After several years of collecting streptocephalids in the Southern Plains regions of the United States, it has become apparent that some of the specimens do not conform with descriptions of *Streptocephalus texanus* Packard, to which species I have previously assigned all streptocephalids not having the peculiar spinous furcae of *S. seali*. I have in the past considered *S. texanus* rather variable. The study of a large number of specimens showed clearly that an undescribed species was present and that characters of all streptocephalids of our Plains region are quite constant. I am much indebted to my wife, Dorothy Louise Mackin, for the preparation of several hundreds of slides making possible the clear distinctions. I accordingly name the new species in her honor.

Technique.—Two techniques were followed in these studies. The first consists of staining specimens with acid fuchsin and dissecting and mounting as usual in Canada balsam. The other method is one worked out to aid in the study of comparatively large parts and organs of these phyllopods, such as the clasping antennae. Specimens are stained with acid fuchsin, with a few drops of hydrochloric acid added as usual, and then are run through the alcohols to benzene. A little Canada balsam is added to the benzene, and the specimens are then dissected. In dissecting for the clasping antennae, the head is cut off and then split along the sagittal plane, so that the two claspers are separated. The benzene is then allowed to evaporate slowly. If done gradually enough, distortion is eliminated. The balsam gives

the specimens a smooth, glossy coat. Both claspers are then stuck with glue or thick balsam on a clean slide, one showing internal view and the other external, and may be studied as opaque objects by direct lighting with an ordinary dissecting binocular. The detail to be seen by this method is considerably more than is possible with cleared mounts. The mounts can be made permanent if protected from dust by a cover glass supported on bits of cork or cork rings.

Genus STREPTOCEPHALUS Baird

STREPTOCEPHALUS DOROTHAE, new species

FIGURES 4, B; 5, B

Description.[1]—The clasping antennae present definite characters that may be noted at a glance. The appendage is rather slender, and the first two segments are much wrinkled on the surface. The spinous processes in a row on the internal surface of the second segment are long and numerous, but this is not a reliable character. The third segment, or scissors, affords the best identification marks. The internal shorter branch bears two processes at the base on the anterior surface (fig. 4, B, at *f*). The shorter proximal one of these curves sharply inward (in fig. 4, B, toward the observer). The distal process is long and slender and curves around the body of the appendage and thus is partly hidden from internal view. (Compare these processes with the homologous structures in *S. texanus* shown in fig. 4, A, at *c*.) Toward the distal end of the inner branch of the scissors, shown at *d* in fig. 4, B, is a swollen area, the anterior surface of which is thin-walled and apt to be wrinkled. There is no process on the posterior side as in *S. texanus*. (Compare with fig. 4, A, at *a* of *S. texanus*.) One character of the external longer branch of the scissors is distinctive: The peculiar shape of the end of the posterior spur, which projects from near the base proximal to the "elbow" (fig. 4, B, at *e*). I have likened this shape of the end of the spur to a tiny foot, seen from side view, the rounded hump on the lower side being the "heel" and the point the "toe." (Compare the spur with that of *S. texanus*, fig. 4, A, at *b*, which is in the form of a smooth-pointed blade.) After comparing hundreds of specimens of *S. dorothae* and *texanus*, I am convinced that these characters of the claspers are constant. One character of the swimming appendages may be of value: In *S. dorothae* the bract is serrate over the entire outer margin. In *S. texanus* there are only a few small spines on this margin at the proximal end, and the remainder is smooth.

[1] In this diagnosis I have eliminated characters of generic and family rank. For instance, if there is nothing distinctive about the first antennae in peculiarities of shape, segmentation, etc., I see no necessity for noting the presence of the appendage, since it is present in all the Streptocephalidae. Thus I have omitted discussion of many characters usually mentioned in descriptions of streptocephalids, hoping to focus attention on those of most value. I do not find streptocephalids difficult to identify, and I am convinced that difficulties experienced by others are due to confusion of species by Packard and other earlier writers.

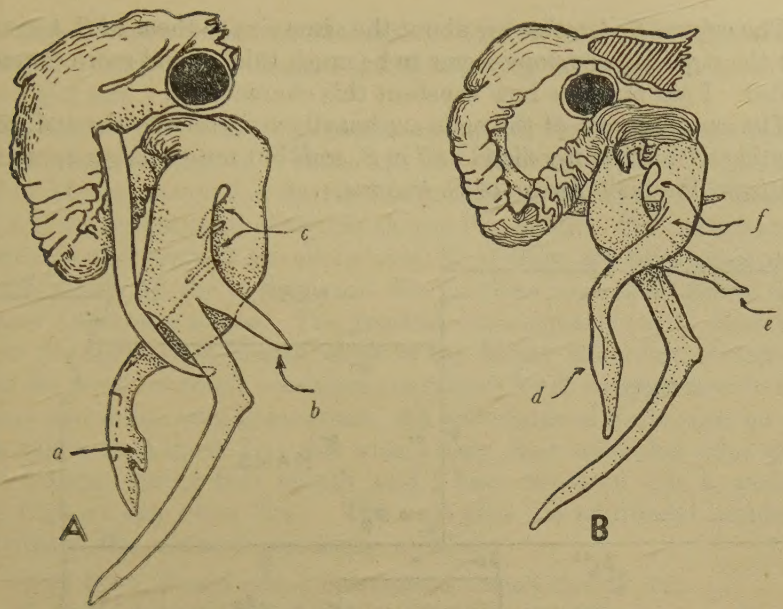

FIGURE 4.—A, *Streptocephalus texanus:* Lateral view of second antennae (*a*, distal end of inner branch of scissors, showing posterior process; *b*, spur projecting from outer branch near the base proximal to the elbow, showing characteristic apex; *c*, the two processes at the base of the anterior surface of the internal shorter branch); B, *S. dorothae:* Median view of male second antennae (*d*, distal end of inner branch of scissors, showing swollen area; *e*, spur projecting from outer branch near the base proximal to the elbow, showing characteristic apex; *f*, the two processes at the base of the anterior surface of the internal shorter branch).

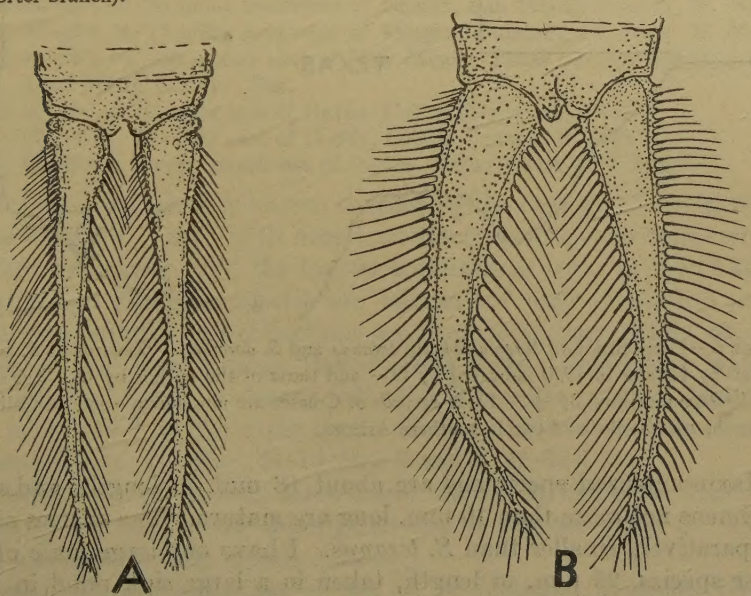

FIGURE 5.—A, *Streptocephalus texanus:* Caudal furcae of male; B, *S. dorothae:* Caudal furcae of male.

The eggs of *S. dorothae* are about the same size as those of *S. texanus*, but the wrinkled envelope seems to be much thicker and more coarsely folded. I am not sure how constant this character is.

The caudal furcae of the male are heavily setiferous to the end, contrasting with the spiny distal half in *S. seali* but not differing appreciably from the male furcae of *S. texanus*.

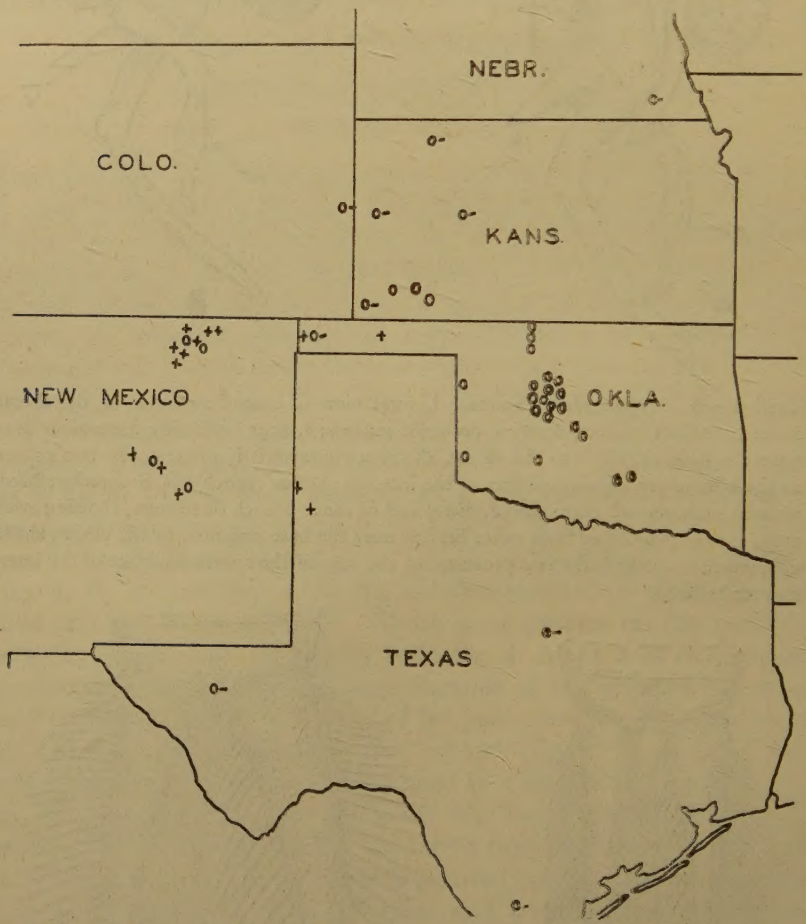

FIGURE 6.—Distribution of *Streptocephalus texanus* and *S. dorothae*. Records of *S. texanus* given by Creaser in 1930 indicated by O— and those of the author by O. Records of *S. dorothae* indicated by +. Three records of Creaser are not shown—one in California near the east border and two in southern Arizona.

Maximum-sized specimens are about 18 mm. in length, and some specimens not more than 10 mm. long are mature. The species seems comparatively smaller than *S. texanus*. I have one large male of the latter species, 29 mm. in length, taken in a large sink pond in New Mexico, south of Santa Fe, and a number of specimens from a pond in

Pontotoc County, Okla., which attain a length of 23 mm. This is the same pond from which Creaser (1930) reported large specimens of *S. seali* (36.2 mm.).

Localities.—The following records are placed in approximate position on the map (fig. 6). There are 14 collections of *S. dorothae*, all in New Mexico except 2 in the far western edge of the Texas Panhandle and 2 in the western end of the Oklahoma Panhandle. For comparison all records of *S. texanus* are also shown; 27 of these are collections and identifications by the author, and the previous records as shown by Creaser (1930) are added. The greatest concentrations of *S. dorothae* are in the short-grass prairie, close to the Rocky Mountain foothills, while the most favorable ecological conditions for *S. texanus* seem to be farther east in the long-grass areas. All collections of *S. dorothae* have been taken in August, but this means only that collecting trips are most feasible during that month, and I have not been able to make such trips at any other time. The date plus the additional number constitutes the author's accession number.

8–12–28+1, 8 miles west of Summerfield, Parmer County, Tex.
8–18–36+3, 1 mile west of Turpin, Texas County, Okla.
8–18–36+4, 12 miles east of Boise City, Cimarron County, Okla.
8–19–36+6, 2 miles west of Capulin, Union County, N. Mex.
8–19–36+7, 10 miles west of Capulin, Colfax County, N. Mex.
8–19–36+8, 10 miles southeast of Raton, Colfax County, N. Mex.
8–19–36+10, 3 miles south of Raton, Colfax County, N. Mex.
8–20–36+11, 20 miles south of Santa Fe, Santa Fe County, N. Mex. (type locality).
8–20–36+12, 35 miles northwest of Encino, San Miguel County, N. Mex.
8–21–36+14, 12 miles northeast of Vaughn, Guadalupe County, N. Mex.
8–21–36+15, 100 meters east of New Mexico-Texas line, on Highway 66, Deaf Smith County, Tex.
8–27–38+3, 10 miles east of Raton, Colfax County, N. Mex.
8–27–38+1, 20 miles east of Colfax, Colfax County, N. Mex.
8–27–38+2, 5 miles southeast of Raton, Colfax County, N. Mex.

Remarks.—Not much is known concerning the ecology of the species of *Streptocephalus*. All North American species prefer clear water with abundant vegetation, and the largest populations occur in such habitats, although all three species are tolerant of high turbidities and limited food supply. All collections are from temporary ponds, or, in some cases, the large prairie "lakes" with widely fluctuating water level. I have on two occasions collected *S. dorothae* and *S. texanus* in the same pond at the same time. Both of these were collections from near Raton, N. Mex. (8–19–36+8 and 8–27–38+3).

Characters of *S. texanus* have been shown in contrast with *S. dorothae* in the text of the description and in figures 4 and 5. The species are undoubtedly closely related.

Cotypes.—In the collection of the U. S. National Museum (No. 79019) and in the collection of the author.

PACKARD'S DESCRIPTIONS OF STREPTOCEPHALUS TEXANUS

From a thorough study of the original and subsequent descriptions of *S. texanus* it becomes clear that Packard confused specimens of *S. seali* with his new species. The original description (1871) is vague, but the fact that he compared it with *S. similis* Baird, 1854, and stated its close kinship to this species shows that he must have had some specimens of *S. seali*. This is borne out by the fact that the figure 13 published with his short notice of *S. texanus* in 1874 is certainly a figure of *S. seali*. It is a rather crude drawing, but characters of the furcae and clasping antennae indicate *S. seali* rather clearly. In 1877 Packard described *S. watsoni*, using specimens from Ellis, Kans. (U. S. N. M. No. 58808). Subsequently he declared this species a synonym of *S. texanus* (1883) and repeated the description as a part of a redescription of *S. texanus*. Since this last description seems to be free from confusion with *S. seali* and is accompanied by good figures, our conception of *S. texanus* should be based on this one, and the original used for the sake of establishing priority alone. Incidentally, the cotypes of *S. watsoni*, in the absence of types of *S. texanus*, become the real basis for the latter species. Through the courtesy of the U. S. National Museum I have examined these specimens and thereby verified my own identifications.

KEY TO NORTH AMERICAN SPECIES OF STRETOCEPHALUS

(Modified from Creaser, 1930, to include *S. dorothae*)

1. Male caudal furcae with setae along basal portion and heavy, curved spines distally ---------- 2
   Male caudal furcae setiferous along entire margin ---------- 3
2. Inner shorter branch of male clasping antennae with 2 processes on anterior margin near proximal end ---------- **seali** Ryder
   Inner shorter branch of male clasping antennae with 3 processes on anterior margin near proximal end ---------- **similis** Baird
3. Inner branch of male clasping antennae with a process on posterolateral margin near distal end; posterior spur of the longer outer branch blade-shaped. **texanus** Packard
   Inner branch of male clasping antennae without a process near distal end; posterior spur of the longer outer branch shaped like a miniature foot at the end ---------- **dorothae**, new species

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